IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Michael J. Heller et al.

Serial No.: 09/597,866

Filed: June 20, 2000

For: APPARATUS AND METHODS FOR ACTIVE PROGRAMMABLE MATRIX DEVICES

Group Art Unit: 1655

Examiner: B. Forman

#9 Pet
2/7/02

AMENDMENT AND RESPONSE

Commissioner of Patents
Washington, D.C. 20231

Sir:

In response to the office action dated November 5, 2001, please enter the following amendments, and consider the following remarks:

IN THE SPECIFICATION

On page 39 of the specification, please add the phrase "SEQ ID NO. 1", preceded by a comma, after the sequence 5'-BYTR-AAATTTTAATATATAAT-3. In addition on page 39, please add the phrase "SEQ ID NO. 2", preceded by a comma, after the sequence 5' BYTR-CCACGTAGAACTGCTCATC-3'.

OC-98369

CERTIFICATE OF MAILING
(37 C.F.R. §1.10)

I hereby certify that this paper (along with any referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as 'Express Mail Post Office To Addressee' in an envelope addressed to the Commissioner for Patents, Washington, D.C. 20231.

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February 05, 2002
Date of Deposit

Adriana Mojarro
Name of Person Mailing Paper

Adriana Mojarro
Signature of Person Mailing Paper

IN THE CLAIMS

Please cancel claims 3, 5-6, 10-12, and 14 without prejudice.

Please amend claims 1, 4, and 7-9 as follows:

D1

1. (AMENDED) An apparatus for the enhanced detection of a biological reaction between a sample and an active area of a biochip, the apparatus comprising:

a biochip having an active area, the active area comprising a plurality of electronically addressable microlocations, the microlocations comprising an electrode, a permeation layer adjacent to the electrode, and specific binding entities attached to the permeation layer, and

a fluidic system comprising a flow cell adjacent to the biochip.

D2

4. (AMENDED) The apparatus for enhanced detection of biological reactions of Claim 1 wherein the flow cell substantially surrounds the active area of the biochip.

D3

7. (AMENDED) The apparatus for enhanced detection of a biological reaction of Claim 1 wherein the flow cell has a defined volume.

D4

8. (AMENDED) The apparatus for enhanced detection of biological reactions of Claim 7 wherein the flow cell has a volume from about 5 to 10 microliters.

D5

9. (AMENDED) The apparatus for enhanced detection of a biological reaction of Claim 1 wherein the flow cell further includes an inlet port and an outlet port.

REMARKS

Objection to Specification

The Examiner objected in the Office Action to the disclosure because a sequence identification number does not identify the nucleic acid sequences on page 39. In response to the Examiner's objection, Applicants have added Sequence ID Numbers to the appropriate part of the specification by the above amendment.

Objections regarding Priority

The Examiner acknowledged and assessed Applicants' claim of priority. Although the Examiner stated that applications 08/304,657, 08/271,882, and 08/146,504 do provide adequate support for claims 10-12 and 14 and that applications 08/271,882 and 08/146,504 do provide adequate support for claims 5 and 7, in light of the Examiner's subsequent statements[1], Applicants assume that the Examiner intended to state that the applications mentioned above do **not** provide adequate support for claims 10-12 and 14 and do **not** provide adequate support for claims 5-**6**. In response, Applicants have cancelled claims 5-6, 10-12, and 14 by this amendment.

Accordingly, Applicants will remove James P. O'Connell, Robert D. Juncosa, Ronald G. Sosnowski, and Thomas R. Jackson as inventors, as their invention is no longer being claimed. Applicants submit herewith papers to amend the inventorship in this application by deleting the above four inventors.

Rejections under 35 U.S.C. § 112

[1] Examiner's conclusion regarding priority: "Therefore, the effective filing date for instant claims 10-12 and 14 is the filing date of Application 08/534,454 i.e. 09/27/1995 and the effective filing date for instant claims 5 and 6 is the filing date of Application 08/304,657 i.e. 09/09/1994."

The Examiner rejected claims 1-18 as indefinite under 35 U.S.C. § 112. Applicants have amended claims 1, 4, and 7-9 to clarify their scope and subject matter. In addition, Applicants have cancelled claim 3 because the amendment to claim 1 made it unnecessary. As noted above, Applicants have also cancelled claims 5-6, 10-12, and 14.

Applicants submit that the subject matter of the claims remains fully supported by the specification. Upon consideration of the language of the claims, as amended, however, Applicants believe that Eugene Tu should be added as an inventor on the instant application. Therefore, Applicants will submit in a separate mailing the papers necessary to amend the inventorship in this application to include Eugene Tu.

Applicants submit that all rejections of claims 1-18 for indefiniteness have been rendered moot by these amendments, and request that the rejections be reconsidered and withdrawn.

Rejections under 35 U.S.C. § 102

The Examiner rejected Claims 1-4, 7, and 9-11 under 35 U.S.C. § 102 as being anticipated by Fodor (U.S. Patent No. 5,324,633). Claims 3 and 10-11 have been cancelled, rendering this rejection moot as to them. Regarding claims 1, 2, 4, 7, and 9, according to MPEP § 2131, "to anticipate a claim, the reference must teach every element of the claim." Because Fodor does not disclose every element of the claimed invention, it is not anticipatory, and Applicants traverse this rejection.

The revisions Applicants have made to the claims by this Amendment clarify the structure of the active area and make plain the differences between the invention of the present application and the invention in Fodor. Applicants claim an active area that includes a plurality of microlocations that are each associated with an electrode that electrophoretically directs molecules to a microlocation. Further, the electrode is adjacent to a permeation layer, and the

specific binding entities are attached to attachment regions disposed upon this permeation layer rather than to the electrode.

The Fodor reference lacks both an electronic component and a permeation layer. It embraces an array of receptor-specific ligands that are attached directly to a substrate. In contrast to the claimed invention, this substrate does not include electrodes to electrophoretically direct transport of the receptors. Instead, the ligands in Fodor are exposed to the receptor molecules by washing the substrate with a receptor solution. In addition, because the Fodor invention does not make use of electrodes, it does not require or disclose the permeation layer of the present application. Because the Fodor reference does not disclose each and every element of the claimed invention, Applicants ask that this rejection be reconsidered and withdrawn.

Rejections under 35 U.S.C. § 103

The Examiner rejected claims 5-6, 8, 12, and 13-18 under 35 U.S.C. § 103 as obvious under Fodor by itself or taken in view of Leland (USP 6,078,782), Ebersole (USP 5,658,732), or Hollis (USP 5,846,708). Claims 5-6, 12, and 14 have been cancelled, rendering this rejection moot as to them. Regarding claims, 8, 13, and 15-18, to establish a *prima facie* case of obviousness, "the prior art reference (or references when combined) must teach or suggest all the claim limitations." MPEP § 2142, "Establishing a *prima facie* case of obviousness." Therefore, Applicants traverse this rejection as neither Fodor by itself nor in combination with any of the other cited references discloses each and every limitation of the claimed invention.

Specifically, the Examiner asserts that claim 8 is obvious over Fodor taken in view of Ebersole. This combination of references does not establish a *prima facie* case of obviousness with regard to the claimed invention. The Examiner asserts that in light of Ebersole it would have been obvious to one of skill in the art to "minimize the volumes in the apparatus of Fodor et

al. and using routine experimentation determine the minimal volumes e.g. 5 to 10 microliters." It is not necessary to discuss the merits of this assertion because the Ebersole reference does not remedy the deficiencies of the Fodor reference described above in the "Rejections under § 102" section. In particular, the Ebersole reference does not disclose the electronic component and the permeation layer of the presently claimed invention that were absent from Fodor. Therefore, the above combination does not disclose each and every limitation of the invention of the present application, and Applicants ask that this rejection be reconsidered and withdrawn.

In addition, the Examiner asserts that claims 13-18 are obvious over Fodor in combination with Hollis. This combination of references does not establish a prima facie case of obviousness as to the claimed invention. The Examiner asserts that Hollis teaches one of ordinary skill in the art to place on a circuit board the apparatus disclosed in Fodor. Hollis, however, does not describe the permeation layer element of the present application that prevents electrochemical degradation of DNA and non-adsorption of DNA to electrodes. Instead, Hollis discloses a passivating layer that can be melted away to expose a glue layer to which probes adhere. The passivating layer also can be used to protect the electrodes from corrosion. But Hollis does not, with its passivating layer, appreciate the DNA-protecting qualities of the permeation layer of the present application. Because the Hollis disclosure does not remedy the deficiencies of the Fodor reference discussed above and because these references do not disclose each and every limitation of the present invention, Applicants ask that this rejection be reconsidered and withdrawn.

Applicants submit that the claims, as amended, are free of the cited art and are in position for allowance. Enclosed herewith is a marked-up version of the changes made to the specification by the current amendment. The attached page is captioned "**Version with**

markings to show changes made." Any fees required by this submission may be charged to deposit account 12-2475. If the Examiner has any questions regarding this communication, or feels that an interview might facilitate prosecution of the application, he is invited to contact the undersigned at (949)567-2300.

Respectfully submitted,

LYON & LYON LLP

Dated: February 5, 2002

By: David Murphy
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION

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a fluidic system comprising a flow cell adjacent ~~adapted to flow the sample over the active area of~~ to the biochip.

4. (AMENDED) The apparatus for enhanced detection of biological reactions of Claim 1~~3~~ wherein the flow cell substantially surrounds the active area of the biochip.

7. (AMENDED) The apparatus for enhanced detection of a biological reaction of Claim 1~~3~~ wherein the flow cell has a defined volume.

8. (AMENDED) The apparatus for enhanced detection of biological reactions of Claim 7 wherein the flow cell has a volume from about ~~substantially~~ 5 to 10 microliters.

9. (AMENDED) The apparatus for enhanced detection of a biological reaction of Claim 1~~3~~ wherein the flow cell further includes an inlet port and an outlet port.